DEMOGRAPHY, DIET AND RANGE SIZE IN A POPULATION OF BLACK-HANDED SPIDER MONKEYS (*ATELES GEOFFROYI YUCATANENSIS*) FROM A NEW STUDY SITE IN BELIZE

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All photos courtesy of Kayla Hartwell unless otherwise noted

Distribution of *Ateles geoffroyi*

Map source: IUCN (IUCNredlist.org)

- *Ateles geoffroyi yucatanensis* is confined to Yucatan Peninsula: southern Mexico, north-eastern Guatemala & Belize

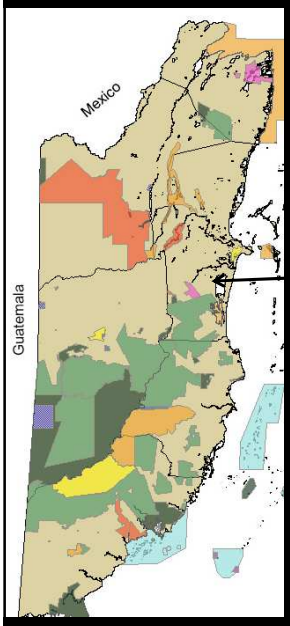
Punta Laguna Nature Reserve, Mexico

Runaway Creek Nature Preserve, Belize

Tikal National Park, Guatemala

image: Google Earth

BELIZE PROTECTED AREAS



RCNP

Runaway Creek Nature Preserve (RCNP)

- 2,469 ha (6,009 acre) private reserve purchased in 1998
- Owned internationally by the Foundation for Wildlife Conservation, Inc.
- Managed locally by Birds Without Borders/*Aves Sin Fronteras*
- Spider monkey habituation began in June 2007
- First site in Belize to study spider monkeys

Image: www.biodiversity.bz

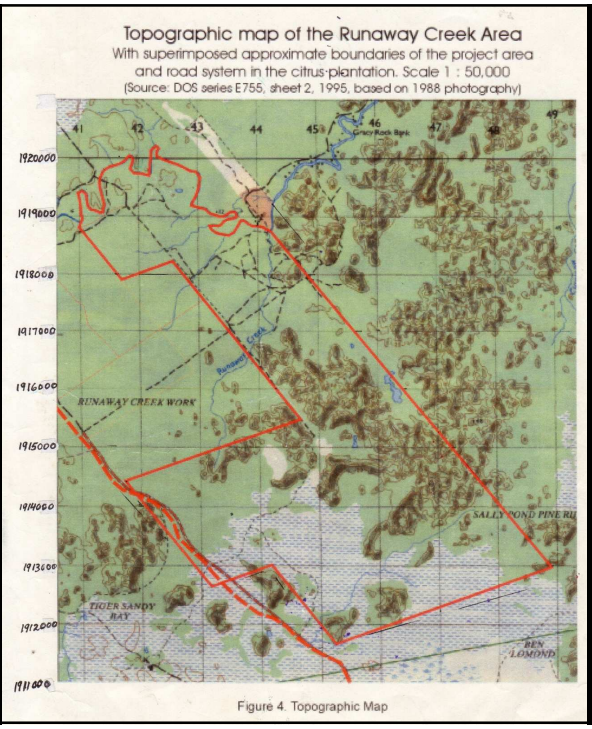


Figure 4. Topographic Map

- Runaway Creek
  - Limestone karst hill topography
  - Tropical broadleaf forest and pine savanna
  - Selective logging until 1970s
  - 2 primate spp. (A. pigra & A. g. yucatanensis)
  - Puma, jaguar, Harpie eagles (historically)

Goals of Primate Research Project at RCNP

- General: Establish a long-term research program to study the behaviour, ecology and conservation of spider monkeys in Belize
- Specific (Years 1-3):
  - Habituate study subjects
  - Establish # of groups in study area
  - Collect demographic data on groups (size; age-sex compositions)
  - Establish ranges and record food species
  - Characterize habitat in terms of food availability

Photo: Paul Durkie

Preliminary questions deriving from early data…

- What are the demographic characteristics of spider monkey sub-groups at RCNP?
  - Average sub-group size and composition
- What, and how many food types do they feed on?
- What is the percentage of different food types in the diet of RCNP spider monkeys?
- Do the diets of males and females differ?
- How does sub-group size vary with variation in food availability?
- How large are the ranges of each group? Do the ranges of males and females differ?

Data collection June 2007 – April 2010

- June/July 2007 – early habituation
- Jan 2008: full or part day subgroup follows
- 5-minute, instantaneous scans at 30 minute intervals
- Up to 4 – 10 minute focal animal samples per hour
- 41 Vegetation plots (20 X 20m). CBH >25cm.
- Phenology trails (from January 2009)

Results

Two separate communities identified (Groups F and G)

Group G (2008 only)

"G Group" Composition				
	ADULT	SUBADULT	JUVENILE	INFANT
MALE	6	3	4	
FEMALE	7	6	3	
UNK SEX				2
Total = 31				

GROUP F composition: number of individuals in each age (A= adult; SA= subadult; J= juvenile; I= infant) and sex (M= male; F= female) class over the course of the study.

Year	Age/sex class								Total
	AM	AF	SAM	SAF	JM	JF	IM	IF	
2008	3	11	2	3	3	2	2	5	31
2009	3	12	2	1	5	4	3	5	35

Average sub-group sizes: F Group (Jan 2008 – April 2010)

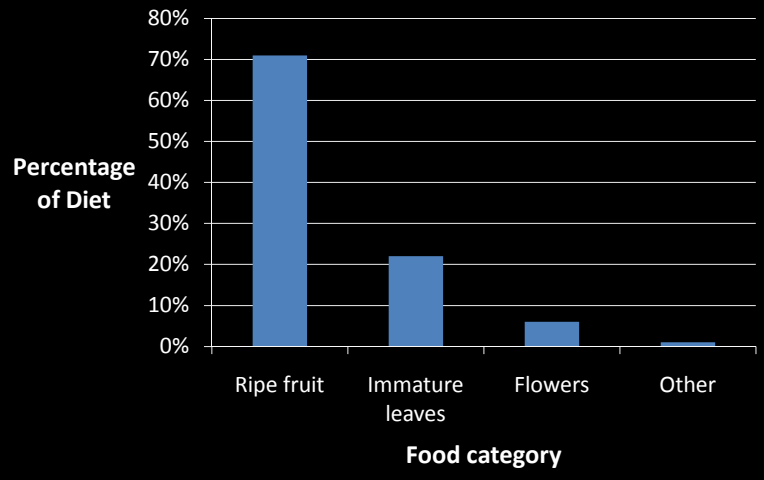
- Average sub-group size (all individuals)
  = 4.77 (N = 1731); Mode = 2
  Average sub-group size without infants
  = 4.74 (N = 1611); Mode = 2
  Average number of males in a sub-group
  = 1.57 (N = 292) Mode = 1
  Average number of females in a sub-group
  = 2.34 (N = 1650) Mode = 1

Diet

- Spiders generally described as "ripe fruit specialists" with a diet comprising >70% fruit, supplemented with young leaves, flowers, bark & insects[1,2]
- At RCNP, spiders recorded to feed on 72 species of trees, vines, and other epiphytic plants.

[1] Cant (1977); [2]Di Fiore & Campbell (2007)

Diet Composition

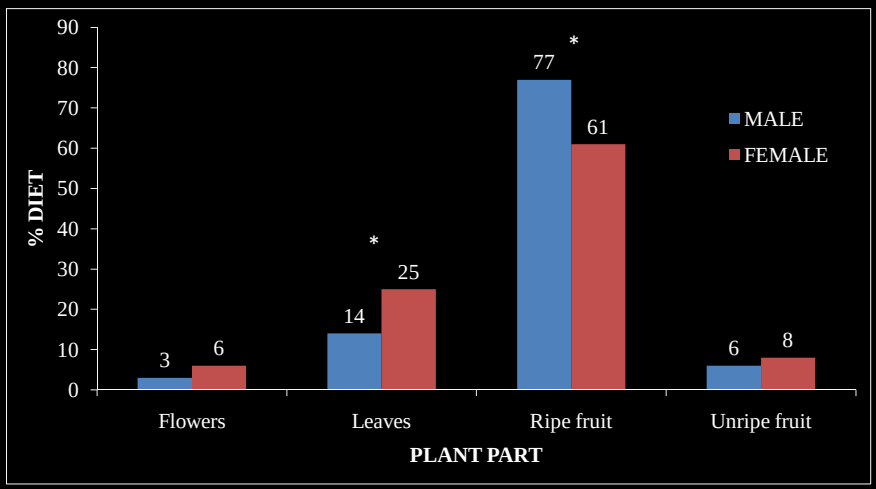


Top food species and their percentage (>1%) of the spider monkey diet

Local Name	Family	Genus	Species	% Diet
1. Fig (5 sp)	Moraceae	*Ficus*	*sp.*	23
2. Sapodilla	Sapotaecae	*Manilkara*	*chicle*	10
3. Copal	Burseraceae	*Protium*	*copal*	9
4. Wild Breadnut	Moraceae	*Brosimum*	*alicastrum*	6
5. Wild Cherry	Moraceae	*Pseudolmedia*	*spuria*	5
6. Black Poisonwood	Anacardiaceae	*Metopium*	*brownie*	5
7. Hog Plum	Anacardiaceae	*Spondias*	*mombin*	5
8. Tiger Bayleaf Palm	Arecaceae	*Sabal*	*yapa*	5
9. Ironwood	Caesalpinaceae	*Dialium*	*quianense*	4
10. Red Ramon	Moraceae	*Trophis*	*racemosa*	3
11. Female Bullhoof	Euphorbiaceae	*Ampelocera*	*hottlei*	3
12. Warrie Wood	Fabaceae	*Caesalpinia*	*gaumeri*	2
13. Cohune Palm	Arecaceae	*Attalea*	*cohune*	2
14. Negrito	Simaroubaceae	*Simarouba*	*glauca*	2

84%

Sex differences in diet



(χ^2 = 21.5 df= 3 *p* = < 0.001)

Food availability and sub-group size

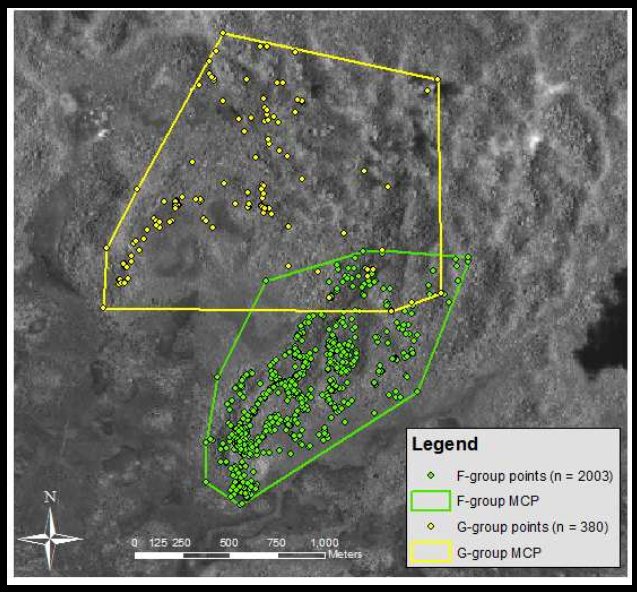
- Food availability did *not* predict average sub-group size on a **monthly** level…

  r = -0.0083, df = 10, *P* = 0.9767 (two-tailed)

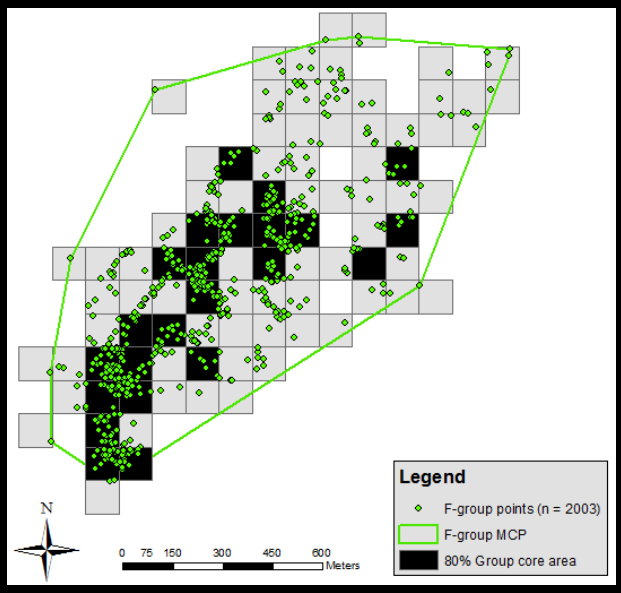
  Or a **bi-weekly** level in 2009

  r = 0.0871, df = 22, *P* = 0.6858 (two-tailed)

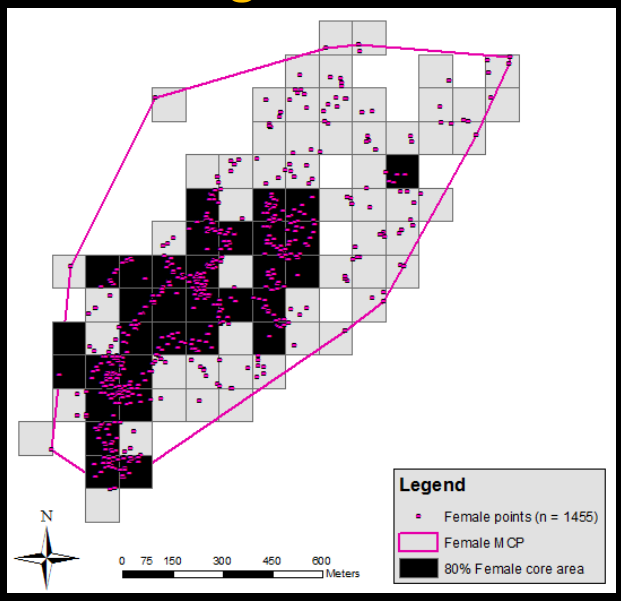
Group Ranges – G & F groups



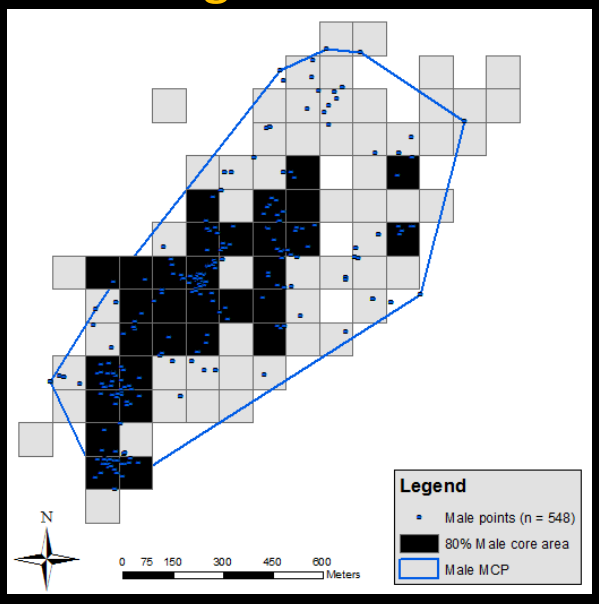
F-group Range & 80% Core Area



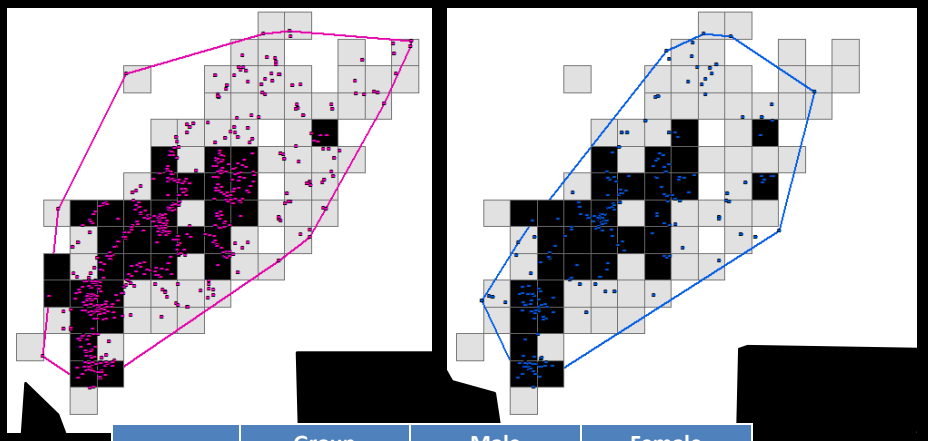
Female Range & 80% Core Area



Male Range & 80% Core Area



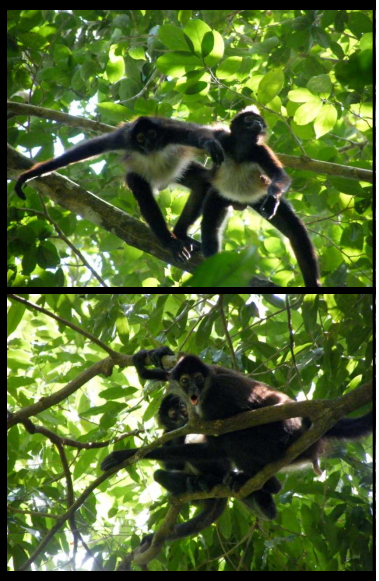
Male and female range comparison



	Group	Male	Female
MCP	109.4 ha	83.8 ha	104.2 ha
Grid cell	92 ha	65 ha	88 ha
80% core	32 ha	31 ha	33 ha

Summary

- Group compositions, diets and ranges described for 2 groups from new study site in Belize
- Food availability did not predict sub-group size
- Female ranges appear larger than those of males, but core areas are very similar
- Current research projects: sex-segregation and fission-fusion dynamics; parasite study of howler and spider monkeys



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Measure of food availability

- Species dominance was calculated by the following steps:
- 1) $(CBH/2\pi)^2 \times \pi$ = area
- 2) Sum of the area for each tree of species A = basal area
- 3) $\frac{\text{Total area of species A}}{\text{Total area sampled}}$ = species dominance

averaged the percent fruit coverage for each tree species, multiplied the average score by the dominance of that species in the area, and then summed all the scores for each bi-weekly period.